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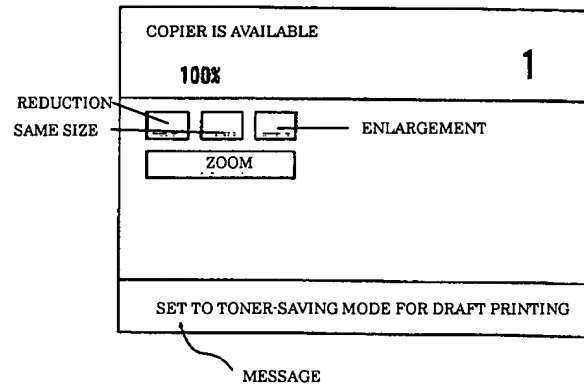
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(54)Title of the Invention: IMAGE FORMING APPARATUS, IMAGE FORMING METHOD, IMAGE FORMING SYSTEM AND RECORDING MEDIUM

(57)[Abstract]

[Object] To enable users to receive messages such as notification of breakdown or maintenance easily, unfailingly and rapidly.

[Solving means] In an image forming apparatus which is connected to a computer, has one display unit and a plurality of functions such as a copier, a facsimile and a printer, and displays information about a running function on the display unit, message data received from the computer is analyzed, and the analyzed message data is displayed on the display unit based on the analysis result.



[Scope of Claim]

[Claim 1]

An image forming apparatus which is connected to a computer, has one display unit and a plurality of functions such as a copier, a facsimile and a printer, and displays information about a running function on the display unit, the image forming apparatus characterized by comprising:

analysis means for analyzing message data received from the computer; and

display control means for displaying analyzed message data on the display unit based on the result of analysis conducted by the analysis means.

[Claim 2]

The image forming apparatus according to claim 1, characterized in that the display unit includes a display screen having different display information for each function, and that the display control means displays the message data corresponding to a function which has been specified by analysis conducted by the analysis means on the display screen for the function.

[Claim 3]

The image forming apparatus according to claim 1, characterized in that, when analysis conducted by the analysis means has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control means displays the message data on a predetermined display area of the display unit.

[Claim 4]

The image forming apparatus according to claim 1, characterized in that, when analysis conducted by the analysis means has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control means checks a predetermined display area of the display unit for no messages and then displays the message data on the predetermined display area.

[Claim 5]

The image forming apparatus according to claim 1, characterized in that, when analysis conducted by the analysis means has determined that the message data is instructed to be displayed on an entire display area of the display unit, the display control means displays the message data on the entire display area of the display unit.

[Claim 6]

The image forming apparatus according to claim 1, characterized in that, when analysis conducted by the analysis means has determined that a display interval is specified for the message data display, the display control means displays the message data on a portion or whole of a specified display area of the display unit at specified display intervals.

[Claim 7]

The image forming apparatus according to claim 1, characterized in that the display control

means deletes the message data displayed on a portion or whole of a display area of the display unit based on a predetermined operation through an operation unit of the image forming apparatus.

[Claim 8]

The image forming apparatus according to claim 1, characterized in that, based on a predetermined operation through an operation unit of the image forming apparatus, the display control means deletes the message data displayed on a portion or whole of a display area of the display unit and redisplay the message data at the display intervals specified by analysis conducted by the analysis means.

[Claim 9]

The image forming apparatus according to claim 1, characterized in that, when analysis conducted by the analysis means has determined that deletion of the message data is prohibited, the display control means does not perform deletion processing even if the display control means is under instructions to delete the message data displayed on a portion or whole of a display area of the display unit based on a predetermined operation through an operation unit of the image forming apparatus.

[Claim 10]

The image forming apparatus according to claim 1, characterized in that the display unit is constituted of a liquid crystal touch panel and has an input operation function and a display function.

[Claim 11]

An image forming method, performed in an image forming apparatus which is connected to a computer, has one display unit and a plurality of functions such as a copier, a facsimile and a printer, and displays information about a running function in the display unit, the method characterized by comprising:

an analysis step of analyzing message data received from the computer; and

a display control step of displaying analyzed message data on the display unit based on the result of analysis conducted by the analysis means.

[Claim 12]

The image forming method according to claim 11, characterized in that the display unit includes a display screen having different display information for each function, and that the display control step displays the message data corresponding to a function which has been specified by analysis conducted by the analysis step on the display screen for the function.

[Claim 13]

The image forming method according to claim 11, characterized in that, when analysis conducted by the analysis step has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control step displays the message data on a predetermined display area of the display unit.

[Claim 14]

The image forming method according to claim 11, characterized in that, when analysis conducted by the analysis step has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control step checks a predetermined display area of the display unit for no messages and then displays the message data on the predetermined display area.

[Claim 15]

The image forming method according to claim 11, characterized in that, when analysis conducted by the analysis step has determined that the message data is instructed to be displayed on an entire display area of the display unit, the display control step displays the message data on the entire display area of the display unit.

[Claim 16]

The image forming method according to claim 11, characterized in that, when analysis conducted by the analysis step has determined that a display interval is specified for the message data display, the display control step displays the message data on a portion or whole of a specified display area of the display unit at specified display intervals.

[Claim 17]

The image forming method according to claim 11, characterized in that the display control step deletes the message data displayed on a portion or whole of a display area of the display unit based on a predetermined operation through an operation unit of the image forming apparatus.

[Claim 18]

The image forming method according to claim 11, characterized in that, based on a predetermined operation of an operation unit of the image forming apparatus, the display control step deletes the message data displayed on a portion or whole of a display area of the display unit and redisplay the message data at the display intervals specified by analysis conducted by the analysis step.

[Claim 19]

The image forming method according to claim 11, characterized in that, when analysis conducted in the analysis step has determined that deletion of the message data is prohibited, the display control step does not perform deletion processing even if the display control step is under instructions, based on a predetermined operation through an operation unit of the image forming apparatus, to delete the message data displayed on a portion or whole of a display area of the display unit.

[Claim 20]

The image forming method according to claim 11, characterized in that the display unit is constituted of a liquid crystal touch panel and has an input operation function and a display function.

[Claim 21]

An image forming system which includes: an image forming apparatus having one display

unit and a plurality of functions such as a copier, a facsimile and a printer, and displaying information about a running function on the display unit; and a computer connected to the image forming apparatus, the image forming system characterized by comprising:

analysis means for analyzing message data received from the computer; and

display control means for displaying analyzed message data on the display unit based on the result of analysis conducted by the analysis means.

[Claim 22]

The image forming system according to claim 21, characterized in that the display unit includes a display screen having different display information for each function, and that the display control means displays the message data corresponding to a function which has been specified by analysis conducted by the analysis means on the display screen for the function.

[Claim 23]

The image forming system according to claim 21, characterized in that, when analysis conducted by the analysis means has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control means displays the message data on a predetermined display area of the display unit.

[Claim 24]

The image forming system according to claim 21, characterized in that, when analysis conducted by the analysis means has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control means checks a predetermined display area of the display unit for no messages and then displays the message data on the predetermined display area.

[Claim 25]

The image forming system according to claim 21, characterized in that, when analysis conducted by the analysis means has determined that the message data is instructed to be displayed on an entire display area of the display unit, the display control means displays the message data on the entire display area of the display unit.

[Claim 26]

The image forming system according to claim 21, characterized in that, when analysis conducted by the analysis means has determined that a display interval is specified for the message data display, the display control means displays the message data on a portion or whole of a specified display area of the display unit at specified display intervals.

[Claim 27]

The image forming system according to claim 21, characterized in that the display control means deletes the message data displayed on a portion or whole of a display area of the display unit based on a predetermined operation through an operation unit of the image forming apparatus.

[Claim 28]

The image forming system according to claim 21, characterized in that, based on a predetermined operation through an operation unit of the image forming apparatus, the display control means deletes the message data displayed on a portion or whole of a display area of the display unit and redisplay the message data at the display intervals specified by analysis conducted by the analysis means.

[Claim 29]

The image forming system according to claim 21, characterized in that, when analysis conducted by the analysis means has determined that deletion of the message data is prohibited, the display control means does not perform deletion processing even if the display control means is under instructions, based on a predetermined operation through an operation unit of the image forming apparatus, to delete the message data displayed on a portion or whole of a display area of the display unit.

[Claim 30]

The image forming system according to claim 21, characterized in that the display unit is constituted of a liquid crystal touch panel and has an input operation function and a display function.

[Claim 31]

A recording medium storing a control program which is executed by an image forming apparatus which is connected to a computer, has one display unit and a plurality of functions such as a copier, a facsimile and a printer, and displays information about a running function on the display unit, the recording medium characterized in that the control program includes:

an analysis routine for analyzing message data received from the computer; and

a display control routine for displaying analyzed message data on the display unit based on the result of analysis conducted by the analysis routine.

[Claim 32]

The recording medium according to claim 31, characterized in that the display unit includes a display screen having different display information for each function, and that the display control routine displays the message data corresponding to a function which has been specified by analysis conducted by the analysis routine on the display screen for the function.

[Claim 33]

The recording medium according to claim 31, characterized in that, when analysis conducted by the analysis routine has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control routine displays the message data on a predetermined display area of the display unit.

[Claim 34]

The recording medium according to claim 31, characterized in that, when analysis conducted

by the analysis routine has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control routine checks a predetermined display area of the display unit for no messages and then displays the message data on the predetermined display area.

[Claim 35]

The recording medium according to claim 31, characterized in that, when analysis conducted by the analysis routine has determined that the message data is instructed to be displayed on an entire display area of the display unit, the display control routine displays the message data on the entire display area of the display unit.

[Claim 36]

The recording medium according to claim 31, characterized in that, when analysis conducted by the analysis routine has determined that a display interval is specified for the message data display, the display control routine displays the message data on a portion or whole of a specified display area of the display unit at specified display intervals.

[Claim 37]

The recording medium according to claim 31, characterized in that the display control routine deletes the message data displayed on a portion or whole of a display area of the display unit based on a predetermined operation of an operation unit through the image forming apparatus.

[Claim 38]

The recording medium according to claim 31, characterized in that, based on a predetermined operation through an operation unit of the image forming apparatus, the display control routine deletes the message data displayed on a portion or whole of a display area of the display unit and redisplayes the message data at the display intervals specified by analysis conducted by the analysis routine.

[Claim 39]

The recording medium according to claim 31, characterized in that, when analysis conducted by the analysis routine has determined that deletion of the message data is prohibited, the display control routine does not perform deletion processing even if the display control routine is under instructions, based on a predetermined operation through an operation unit of the image forming apparatus, to delete the message data displayed on a portion or whole of a display area of the display unit.

[Claim 40]

The recording medium according to claim 31, characterized in that the display unit is constituted of a liquid crystal touch panel and has an input operation function and a display function.

[Detailed Description of the Invention]

[0001]

[Technical Field to which the Invention Pertains]

The present invention relates to a method for controlling an image forming apparatus having

a plurality of functions such as a copier, a facsimile and a printer, and to a display method.

[0002]

Never before has such a function been provided that transmits messages corresponding to the respective functions from an external host computer and allows such an image forming apparatus having a plurality of functions to display the messages.

[0003]

Accordingly, when one of the plurality of functions has a failure for example, it has been impossible to inform users to that effect effectively in spite of the fact that other functions are still available. Thus, such information has been passed to users by posting a written notice, which notifies the users that an image forming apparatus is out of order or under maintenance, on the main body of the image forming apparatus, or by sending mails to them.

[0004]

[Problems to be Solved by the Invention]

As described above, transmission of messages such as notification of breakdown and maintenance to users has conventionally been a complicated operation, putting heavy burden on an administrator of an image forming apparatus and causing delay in message transmission. In some cases, messages have not been transmitted without fail.

[0005]

Although an image forming apparatus is mounted with various functions (such as power saving and toner saving) for cost reduction, there has also been a problem that the administrator of the image forming apparatus cannot easily, unfailingly and rapidly notify users that these functions are mounted, and therefore the functions are not utilized effectively.

[0006]

The present invention has been accomplished under such a background, and an object thereof is to enable users to receive messages such as notification of breakdown and maintenance easily, unfailingly and rapidly.

[0007]

[Means for Solving the Problems]

In order to solve the foregoing problems, the present invention provides an image forming apparatus which is connected to a computer, has one display unit and a plurality of functions such as a copier, a facsimile and a printer, and displays information about a running function on the display unit. The image forming apparatus characterized by including: analysis means for analyzing message data received from the computer; and display control means for displaying analyzed message data on the display unit based on the result of analysis conducted by the analysis means.

[0008]

The present invention provides an image forming method, performed in an image forming

apparatus which is connected to a computer, has one display unit and a plurality of functions such as a copier, a facsimile and a printer, and displays information about a running function on the display unit. The method is characterized by including: an analysis step of analyzing message data received from the computer; and a display control step of displaying analyzed message data on the display unit based on the result of analysis conducted by the analysis means.

[0009]

Moreover, the present invention provides an image forming system which includes: an image forming apparatus having one display unit and a plurality of functions such as a copier, a facsimile and a printer, and displaying information about a running function on the display unit; and a computer connected to the image forming apparatus. The image forming system is characterized by including: analysis means for analyzing message data received from the computer; and display control means for displaying analyzed message data on the display unit based on the result of analysis conducted by the analysis means.

[0010]

The present invention provides a recording medium storing a control program which is executed by an image forming apparatus, the image forming apparatus connected to a computer, having one display unit and a plurality of functions such as a copier, a facsimile and a printer, and displaying information about a running function on the display unit. The recording medium is characterized in that the control program includes: an analysis routine for analyzing message data received from the computer; and a display control routine for displaying analyzed message data on the display unit based on the result of analysis conducted by the analysis routine.

[0011]

In the present invention, the display unit includes a display screen having different display information for each function, and the display control means displays the message data corresponding to a function which has been specified by analysis conducted by the analysis means on the display screen for the function.

[0012]

In the present invention, when analysis conducted by the analysis means, the analysis step and the analysis routine has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control means, the display control step and the display control routine display the message data on a predetermined display area of the display unit.

[0013]

In the present invention, when analysis conducted by the analysis means, the analysis step and the analysis routine has determined that the message data is instructed to be displayed on a portion of a display area of the display unit, the display control means, the display control step and the display control routine check a predetermined display area of the display unit for no messages and then displays

the message data on the predetermined display area.

[0014]

In the present invention, when analysis conducted by the analysis means, the analysis step and the analysis routine has determined that the message data is instructed to be displayed on the entire display area of the display unit, the display control means, the display control step and the display control routine display the message data on the entire display area of the display unit.

[0015]

In the present invention, when analysis conducted by the analysis means, the analysis step and the analysis routine has determined that a display interval is specified for the message data display, the display control means, the display control step and the display control routine display the message data on a portion or whole of the specified display area of the display unit at specified display intervals.

[0016]

In the present invention, based on a predetermined operation through an operation unit of the image forming apparatus, the display control means, the display control step and the display control routine delete the message data displayed on a portion or whole of the display area of the display unit.

[0017]

In the present invention, based on a predetermined operation through the operation unit of the image forming apparatus, the display control means, the display control step and the display control routine delete the message data displayed on a portion or whole of the display area of the display unit and redisplay the message data at the display intervals specified by analysis conducted by the analysis means, the analysis step and the analysis routine.

[0018]

In the present invention, when analysis conducted by the analysis means, the analysis step and the analysis routine has determined that deletion of the message data is prohibited, the display control means, the display control step and the display control routine do not perform deletion processing even when they are under instructions, based on a predetermined operation through the operation unit of the image forming apparatus, to delete the message data displayed on a portion or whole of the display area of the display unit.

[0019]

In the present invention, the display unit is constituted of a liquid crystal touch panel and has an input operation function and a display function.

[0020]

[Embodiments of the Invention]

Hereinafter, embodiments of the present invention will be described with reference to the drawings.

[0021]

Fig. 1 is a block diagram showing a diagrammatic configuration of an image forming apparatus according to the embodiments of the present invention. A reader unit 1 is connected to an image input/output controller unit 3. The reader unit 1 reads an image of an original, and outputs image data corresponding to the original image to a printer unit 2 and the image input/output controller unit 3. The printer unit 2 records on recording sheets images corresponding to image data sent from the reader unit 1 and the image input/output controller unit 3. The image input/output controller unit 3 includes a facsimile unit 4, a file unit 5, a magneto-optical disk drive unit 6, a computer interface unit 7, a formatter unit 8, an image memory unit 9, a core unit 10 and hard disks 12 and 13.

[0022]

The facsimile unit 4 extends compressed image data received via a telephone line, and transfers the extended image data to the core unit 10. Conversely, the facsimile unit 4 compresses image data transferred from the core unit 10, and transmits the compressed image data via the telephone line. The hard disk 12 is connected to the facsimile unit 4. Thus, it is possible to temporarily store the compressed image data which has been received.

[0023]

The magneto-optical disk drive unit 6 is connected to the file unit 5. The file unit 5 compresses image data transferred from the core unit 10, and stores the compressed image data in a magneto-optical disk placed in the magneto-optical disk drive unit 6 together with a keyword for searching for the compressed image data. Moreover, the file unit 5 searches the magneto-optical disk for compressed image data using the keyword transferred via the core unit 10, reads the retrieved compressed image data followed by extension thereof, and transfers the extended image data to the core unit 10.

[0024]

The computer interface unit 7 interfaces a personal computer or a work station (PCWS, hereinafter referred to as a computer) 11 with the core unit 10. The formatter unit 8 expands code data which represents images transferred from the computer 11 into image data that can be recorded by the printer unit 2. The hard disk 13 is connected to the formatter unit 8, thus making it possible to temporarily store code data representing an image which has been transferred from the computer 11 or image data.

[0025]

The image memory unit 9 temporarily stores data transferred from the computer 11. The core unit 10, which will be described in detail later, controls the data flow between the reader unit 1, facsimile unit 4, file unit 5, computer interface unit 7, formatter unit 8 and image memory unit 9.

[0026]

Fig. 2 is a cross-sectional view of the reader unit 1 and printer unit 2. An original feeder 101 in the reader unit 1 feeds one original after another on a platen glass 102 sequentially from the last page

to the first page. After having read all originals, the original feeder 101 ejects them from the platen glass 102. In feeding the originals onto the platen glass 102, a lamp 103 is turned on, and then a scanner unit 104 is moved to scan the originals by projecting a beam of light over them.

[0027]

The light reflected from each original is guided to a CCD image sensor (hereinafter referred to as CCD) 109 by mirrors 105, 106, 107 and a lens 108. Thus, the image light of each scanned original enters the CCD 109 for photoelectrical conversion, and is outputted as image data. The image data outputted from the CCD 109 is then subjected to a predetermined processing, and thereafter the processed data is then transferred to the printer unit 2 and core unit 10 in the image input/output controller unit 3.

[0028]

A laser driver 221 in the printer unit 2 drives a laser beam projector unit 201 to project a laser beam corresponding to the image data outputted from the reader unit 1. The laser beam is irradiated to a photosensitive drum 202 to form a latent image corresponding to the laser light thereon. A developer adheres to a developing unit 203 on the latent portion of the photosensitive drum 202. Then, a recording sheet is fed and transferred to a transfer unit 206 from either of cassettes 204 or 205 at a rate synchronized with initiation of projection of the laser beam, thereby transferring the developer adhered to the photosensitive drum 202 to the recording sheet.

[0029]

The recording sheet having the transferred developer is fed to a fixing unit 207, where the developer is fixed to the recording sheet by heat and pressure from the fixing unit 207. The recording sheet having passed through the fixing unit 207 is then ejected by means of ejection rollers 208. A sorter 220 holds and sorts the ejected recording sheets into respective bins. Note that the sorter 220 holds recording sheets on its uppermost bin when a sorting mode is not set.

[0030]

When a double-sided recording mode is set, a recording sheet is fed to a position where the ejection rollers 208 are provided. Thereafter, the ejection rollers 208 are reversely rotated to cause a flapper 209 to guide the recording sheet to a re-feeding path while turning the recording sheet upside down. Moreover, when a multiple recording mode is set, a recording sheet is guided to the re-feeding path by the flapper 209 while not turning the recording sheet upside down so that the recording sheet is not transferred to the position of the ejection rollers 208. The recording sheet guided to the re-feeding path is then fed to the transfer unit 206 at the above-described rate.

[0031]

Fig. 3 is a block diagram of the reader unit 1. The image data outputted from the CCD 109 is subjected to analog/digital conversion and shading correction in an A/D-SH unit 110. The image data processed by the A/D-SH unit 110 is transferred to the printer unit 2 via an image processing unit 111

and to the core unit 10 in the image input/output controller unit 3 via an interface unit 113.

[0032]

A CPU 114 controls the image processing unit 111 and the interface 113 according to the setting information, which is set in an operation unit 115. When a copy mode is set in the operation unit 115, where a trimming processing is performed prior to copying, the trimming processing is performed in the image processing unit 111 and the processed data is transferred to the printer unit 2. In addition, when a facsimile transmission mode is set in the operation unit 115, image data and controlling commands corresponding to the set mode are transferred from the interface 113 to the core unit 10. Such programs for controlling the CPU 114 are stored in a memory 116. The CPU 114 performs control operations with reference to the memory 116. Moreover, the memory 116 is also used as a working area of the CPU 114.

[0033]

The operation unit 115 is constituted of a liquid crystal touch panel, and has an input operation function and a display function. In other words, a start key SK for initiating processes, a reset key RK for stopping the running processing or mode, a mode setting key MK for setting modes such as a copy mode, a facsimile mode and a printer mode, numeric keys TK for inputting the number of copies and the like are displayed on the display screen of the operation unit 115. Note that various message data sent from an administrator's computer 11 are also displayed on the display screen of the operation unit 115. In addition, different pieces of information corresponding respectively to the running or designated functions (i.e., a copier, a facsimile and a printer) are displayed on the display screen of the operation unit 115.

[0034]

Fig. 4 is a block diagram of the core unit 10. The image data from the reader unit 1 is transferred to a data processing unit 121. The control commands from the reader unit 1 are transferred to a CPU 123. The data processing unit 121 performs image processing operations such as rotation or magnification of an image. In response to the control commands transferred from the reader unit 1, the image data transferred from the reader unit 1 to the data processing unit 121 is transferred via an interface 120 to the facsimile unit 4, the file unit 5 or the computer interface unit 7.

[0035]

Moreover, code data, which represents images inputted via the computer interface 7, is transferred to the data processing unit 121. Thereafter, the transferred code data is transferred to the formatter unit 8, and is expanded into image data therein. This image data is transferred to the data processing unit 121, and then transferred to the facsimile unit 4 or printer unit 2. The image data from the facsimile unit 4 is transferred to the data processing unit 121, and then transferred to the printer unit 2, the file unit 5 and the computer interface unit 7. Furthermore, the image data from the file unit 5 is transferred to the data processing unit 121, and then transferred to the printer unit 2, the facsimile

unit 4 and the computer interface unit 7.

[0036]

The CPU 123 performs the above-described control operations in accordance with the controlling programs stored in a memory 124 and with the control commands transferred from the reader unit 1. Furthermore, the memory 124 is also used as a working area of the CPU 123.

[0037]

Thus, using the core unit 10 as the nucleus, it is possible to perform processing where functions such as the reading of original images, the printing of images, transmission and reception of images, storage of images, and input/output of data from computers are combined.

[0038]

When code data, which represents images transferred from the computer 11, is received via the computer interface unit 7, the formatter unit 8 provides notification about initiation of jobs to the core unit 10. After having received notification about acceptance of job initiation from the core unit 10, the formatter unit 8 expands code data into bitmap image data which can be recorded by the printer unit 2. The formatter unit 8 then stores the bitmap image data in the hard disk 13 temporarily. In this case, output operation setting information such as a feeding tray to be used, the number of copies, and single-sided/double-sided printing is also stored in the hard disk 13 temporarily. Subsequently, the image data and output operation setting information are transferred to the printer unit 2 via a bus, and printing is performed. Printing of multiple copies, output of 3 copies of 3 pages for example, is realized by repeating the printing of 1 to 3 pages for 3 times.

[0039]

As shown in Fig. 5, the message data, which is peculiar to the present invention and is transmitted to the image forming apparatus from the computer 11, can be created in Graphical User Interface (GUI) format. Specifically, a message display screen shown in Fig. 5 is displayed by a predetermined operation through the computer 11. On this message display screen, as keys (or icons) for designating a mode (function) where messages are to be displayed, a copy key 51, a printer key 52 and a FAX key 53 are displayed. Thus, specified operations are performed, including designating and clicking the desired key using a mouse from among these keys. Note that Fig. 5 shows a state where the copy key 51 is designated.

[0040]

An area 56 in the status line shown in Fig. 5 is an area where message data to be displayed only on a portion (line) of the display screen of the operation unit 115 of the image forming apparatus is inputted. For example, a brief message data such as "Push reset key after use" is inputted in its input area 57. Moreover, a delete key 58 is also displayed on the area 56 in the status line. The message data inputted in the input area 57 in the status line is transmitted to the image forming apparatus, and is displayed on the display screen of the operation unit 15. When this message data has served its

purpose, the delete key 58 instructs the image forming apparatus not to display the message data again.

[0041]

A pop-up area 59 is an area where message data to be displayed on the entire display screen of the operation unit 115 of the image forming apparatus is inputted. A long message data as shown in this figure is inputted in its input area 60.

[0042]

A notification key 61 is a key indicating that the message data inputted in the input area 60 is message data concerning notification. When the notification key 61 is turned on, the message data concerning notification cannot be optionally deleted on the image forming apparatus side. Moreover, an emergency key 62 is a key indicating that the message data inputted in the input area 60 is message data concerning emergency. When the emergency key 62 is turned on, the message data concerning emergency cannot be optionally deleted on the image forming apparatus side.

[0043]

A display time specifying area 63 is an area where a display interval is inputted when the message data inputted in the input area 60 is to be displayed on the display screen of the operation unit 115 of the image forming apparatus. For example when "0 minute" is inputted in the display time specifying area 63, the message data is displayed on the display screen all the time. When "1 minute" is inputted, each message data is displayed at 1-minute interval respectively for a predetermined time.

[0044]

Note that a delete key 64 in the pop-up area 59 plays a similar role as the delete key 58 in the area 56 of the status line for deletion of the message data inputted in the input area 60. Moreover, an OK key 54 is a key for defining the setting information. A cancel key 55 is a key for canceling the setting information.

[0045]

In addition, the above-described functions of the computer 11 for the setting and the transmitting of message data and the like are realized by application programs stored in, for example, flexible disks, CD-ROMs and the like (not shown). Furthermore, the information shown in Fig. 5 corresponds to a first embodiment to be described later. In a below-described second embodiment, the display time specification area 63 is omitted from Fig. 5.

[0046]

[First embodiment]

Next, a description will be given of a message display processing which is peculiar to the present invention. First, a message display processing according to the first embodiment of the present invention will be described.

[0047]

The formatter unit 8 receives message data from the computer 11 via the computer interface

unit 7. The formatter unit 8 stores the received message data in the hard disk 13. Here, the received message data is analyzed in accordance with flow charts shown in Figs. 6 and 7, and is then displayed.

[0048]

Specifically, message data is captured in step S1 shown in Fig. 6. In step S2, it is determined whether or not the message data is one to be displayed on the entire display screen. When it has been determined that the message data is not one to be displayed on the entire screen, determination is then made in steps S3 to S5 as to whether the message data is one to be displayed on a portion of the copy screen, one to be displayed on a portion of the facsimile screen, or one to be displayed on a portion of the printer screen.

[0049]

From here on down, a description will be given of message data to be displayed on a portion of the copy screen. However, it goes without saying that similar descriptions will be given of message data to be displayed on a portion of the facsimile screen and of message data to be displayed on a portion of the printer screen.

[0050]

When it has been determined that message data is one to be displayed on a portion of the copy screen, determination is made in step S6 as to whether or not the display screen of the operation unit 115 is the copy screen at the moment and whether or not messages can be displayed thereon (step S6). When it has been determined that the display screen is not the copy screen, or that although the display screen is the copy screen, messages cannot be displayed on the copy screen because other data are already displayed thereon, the processing waits until messages can be displayed on the copy screen.

[0051]

Meanwhile, when it has been determined that the display screen is the copy screen and messages can be displayed thereon, messages received from the computer 11 are displayed on a predetermined display area on the display screen of the operation unit 115 as shown in Fig. 8 (step S7). The messages are never deleted before receiving deletion commands from the computer 11 or messages with higher priority are displayed. Moreover, messages are stored in the hard disk 13 as described above, and are therefore retained even when the image forming apparatus is turned off. Thus, the messages are redisplayed when the apparatus is turned on again.

[0052]

When it has been determined in the above step 2 that message data is one to be displayed on the entire screen, determination is then made in steps S8 to S10 as to whether the message data is one to be displayed on the entire copy screen, one to be displayed on the entire facsimile screen, or one to be displayed on the entire printer screen.

[0053]

From here on down, a description will be given of message data to be displayed on the entire

copy screen. However, it goes without saying that similar descriptions will be given of message data to be displayed on the entire facsimile screen and of message data to be display on the entire printer screen.

[0054]

When it has been determined that the message data is one to be displayed on the entire copy screen, determination is then made in step 11 as to whether or not the message data need to be immediately displayed. When it has been determined that the display interval described above is not "0 minute", meaning the message data is not one that needs to be displayed immediately, in step 12, a timer is set for the period of time specified as the display interval. Thus, the processing waits until the specified display interval time elapses. The processing then proceeds to step S13. On the other hand, when it has been determined that the display interval described above is "0 minute", meaning the message data is one that needs to be displayed immediately, the processing immediately proceeds to the step S13, and as shown in Fig. 9, the messages are displayed on the copy screen. The messages are displayed all the time until a user instructs deletion of the messages (i.e., the pushing of the OK key 91) on the copy screen shown in Fig. 9 (step S14).

[0055]

When it has been determined that deletion is instructed, in step S15, the timer is set for the period of time specified as the display interval. The processing then goes back to the step S13, and after having passed the specified period of time, messages as shown in Fig. 9 are displayed again. This redisplay of messages enables a plurality of users to confirm messages while reducing electric power consumption.

[0056]

Note that even when the emergency key shown in Fig. 5 is not pushed and a user instructs deletion of message data (i.e., the pushing of the OK key 91), important messages are displayed almost all the time if the display interval time is set to "0 minute", meaning that the messages cannot virtually be deleted.

[0057]

This flow is repeated until an instruction for deletion of messages is sent from the computer 11. Moreover, since messages are stored in the hard disk 13 as described above, the messages are retained even when the image forming apparatus is turned off, and are redisplayed when the apparatus is turned on again. For this reason, it is possible to send messages to other users even if the apparatus has been turned off once.

[0058]

[Second embodiment]

Next, a description will be given of a message display processing according to a second embodiment of the present invention.

[0059]

The formatter unit 8 receives message data from the computer 11 via the computer interface unit 7. The formatter unit 8 stores the received message data in the hard disk 13. Here, the received message data is analyzed in accordance with flow charts shown in Figs. 10 and 11, and is then displayed.

[0060]

Specifically, message data is captured in step S21 shown in Fig. 10. In step S22, it is determined whether or not the message data is one to be displayed on the entire display screen. When it has been determined that the message data is not one to be displayed on the entire screen, determination is then made in steps S23 to S25 as to whether the message data is one to be displayed on a portion of the copy screen, one to be displayed on a portion of the facsimile screen, or one to be displayed on a portion of the printer screen.

[0061]

From here on down, a description will be given of message data to be displayed on a portion of the copy screen. However, it goes without saying that similar descriptions will be given of message data to be displayed on a portion of the facsimile screen and of message data to be displayed on a portion of the printer screen.

[0062]

When it has been determined that the message data is one to be displayed on a portion of the copy screen, determination is then made in step S26 as to whether or not the display screen of the operation unit 115 is the copy screen at the moment. Furthermore, the processing waits for operation of a display trigger key. Here, for example, the start key SK or the like, which is inevitably operated, is used as the display trigger key.

[0063]

When the display trigger key is operated in a state where the copy screen is displayed (i.e., in a copy mode state), messages received from the computer 11 are displayed on a predetermined display area on the display screen of the operation unit 115 as shown in Fig. 8 (step S27). The processing then waits for operation of a deletion trigger key (step S28). Here, for example, the reset key RS or the like, which is inevitably operated, is used as the deletion trigger key. When the deletion trigger key is operated, the messages displayed in the step S27 are deleted (step S29). The processing then goes back to the step S26 to display messages again by operating a display trigger key again. This redisplay of messages enables a plurality of users to confirm messages while reducing electric power consumption.

[0064]

When it has been determined in the above step 22 that the message data is not one to be displayed on the entire screen, determination is then made in steps S30 to S32 as to whether the message data is one to be displayed on the entire copy screen, one to be displayed on the entire facsimile

screen, or one to be displayed on the entire printer screen.

[0065]

From here on down, a description will be given of message data to be displayed on the entire copy screen. However, it goes without saying that similar descriptions will be given of message data to be displayed on the entire facsimile screen and of message data to be displayed on the entire printer screen.

[0066]

When it has been determined that the message data is one to be displayed on the entire copy screen, determination is then made in step S33 as to whether or not the display screen of the operation unit 115 is the copy screen at the moment. Furthermore, the processing waits for operation of a display trigger key. Here, for example, the start key SK or the like, which is inevitably operated, is used as the display trigger key.

[0067]

When the display trigger key is operated in a state where the copy screen is displayed (i.e., in a copy mode state), messages received from the computer 11 are displayed on the entire display screen of the operation unit 115 as shown in Fig. 9 (step S34). The processing then waits for operation of a deletion trigger key (step S35). Here, for example, the reset key RS or the like, which is inevitably operated, is used as the deletion trigger key. When the deletion trigger key is operated, the messages displayed on the entire screen in the step S34 are deleted (step S36). The processing then goes back to the step S33 to display messages again by operating a display trigger key again. This redisplay of messages enables a plurality of users to confirm messages while reducing electric power consumption.

[0068]

This flow is repeated until an instruction for deletion of messages is sent from the computer 11. Moreover, since messages are stored in the hard disk 13 as described above, the messages are retained even when the image forming apparatus is turned off, and are redisplayed when the apparatus is turned on again. For this reason, it is possible to send messages to other users even if the apparatus has been turned off once.

[0069]

As described above, in the first and second embodiments, an image forming apparatus having a plurality of functions such as a copier, a facsimile and a printer is configured to display messages corresponding to the respective running functions at a desired rate. This can be achieved by transmitting message data such as notification of breakdown or maintenance of the respective functions to the image forming apparatus from a computer. Accordingly administrators do not have to post a written notice or the like, which notifies users that the image forming apparatus is out of order, under maintenance or the like, on the main body of the image forming apparatus, thereby reducing burden on them.

[0070]

Further, messages can also draw users' attention to cost reduction and reduce burden on administrators that comes along with cost reduction. Furthermore, messages can more effectively draw users' attention to cost reduction, rather than giving verbal instructions or written notice by administrators to draw users' attention to cost reduction, thereby ensuring cost reduction.

[0071]

It should be noted that the present invention is not limited to the embodiments described above. For example, in a plurality of multifunction image forming apparatuses which are connected with each other via a network such as a LAN, it is also possible to cause a computer on the network to transmit message data corresponding to the respective functions, such as notification of breakdown or maintenance, to the image forming apparatuses and to make them display the received message data.

[0072]

In addition, even when message data is displayed on a portion of a display screen, it is also possible to delete the displayed message data by the setting of the display interval, a user's operation of keys or the like, as in the case of displaying message data on the entire display screen.

[0073]

[Effects of the Invention]

As described above, according to the present invention, there is provided an image forming apparatus which is connected to a computer, has one display unit and a plurality of functions such as a copier, a facsimile and a printer, and displays information about a running function on the display unit, the image forming apparatus including analysis means for analyzing message data received from the computer and display control means for displaying analyzed message data on the display unit based on the result of analysis conducted by the analysis means. Accordingly, it is made possible for users to receive messages such as notification of breakdown, maintenance or the like easily, unfailingly and rapidly.

[Brief Description of the Drawings]

Fig. 1 is a block diagram showing an image forming apparatus according to an embodiment of the present invention.

Fig. 2 is a cross-sectional view of a reader unit and printer unit of the image forming apparatus shown in Fig. 1.

Fig. 3 is a block diagram showing the reader unit.

Fig. 4 is a block diagram showing a core unit.

Fig. 5 shows a message display setting screen in a case where message data is to be created on a computer side.

Fig. 6 is a flow chart showing message display operation according to a first embodiment of the present invention.

Fig. 7 is a flow chart continued from Fig. 5.

Fig. 8 shows a state where messages are displayed on a portion of a screen of an operation unit.

Fig. 9 shows a state where messages are displayed on an entire screen of the operation unit.

Fig. 10 is a flow chart showing message display operation according to a second embodiment of the present invention.

Fig. 11 is a flow chart continued from Fig. 10.

[Explanation of Reference Numerals]

- 1...Reader unit
- 2...Printer unit
- 3...Image input/output controller unit
- 4...Facsimile unit
- 5...File unit
- 7...Computer interface unit
- 8...Formatter unit
- 9...Image memory unit
- 10...Core unit
- 12, 13...Hard disk
- 51...Copy key
- 52...Printer key
- 53...FAX key
- 57...Input area for brief messages
- 58, 6...Delete key
- 60...Input area for long messages
- 63...Display interval input area
- 114, 123...CPU
- 115...Operation unit (liquid crystal touch panel)
- 116, 124...Memory

FIG. 1

- 1 READER UNIT
- 2 PRINTER UNIT
- 3 IMAGE INPUT/OUTPUT CONTROLLER UNIT
- 4 FACSIMILE UNIT
- 5 FILE UNIT
- 6 MAGNETO-OPTICAL DISK DRIVE UNIT
- 7 COMPUTER INTERFACE UNIT
- 8 FORMATTER UNIT
- 9 IMAGE MEMORY UNIT
- 10 CORE UNIT
- 12, 13 HARD DISK
- TELEPHONE LINE

FIG. 3

- 1 READER UNIT
- 111 IMAGE PROCESSING UNIT
- 115 OPERATION UNIT (LIQUID CRYSTAL TOUCH PANEL)
- START
- RESET
- MODE
- NUMERIC
- 116 MEMORY
- TO CORE UNIT 10
- TO PRINTER UNIT 2

FIG. 4

- 4 FACSIMILE UNIT
- 5 FILE UNIT
- 7 COMPUTER INTERFACE UNIT
- 8 FORMATTER UNIT
- 9 IMAGE MEMORY UNIT
- 10 CORE UNIT
- 121 DATA PROCESSING UNIT
- 124 MEMORY
- TO READER UNIT 1

FIG. 5

MESSAGE DISPLAY SETTING

51 COPY
 52 PRINTER
 56 STATUS LINE
 57 PUSH RESET KEY AFTER USE
 58 DELETE
 59 POP UP
 60 PLEASE NOTE THAT COPIER IS NOT AVAILABLE DURING THE
 FOLLOWING MAINTENANCE PERIOD
 JUNE 21, SUNDAY 10:00 TO 12:00
 61 NOTIFICATION
 62 EMERGENCY
 63 DISPLAY
 EVERY X MINUTE
 64 DELETE

FIG. 6

S1 READ MESSAGE DATA
 S2 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON ENTIRE
 SCREEN?
 S3 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON COPY
 SCREEN?
 S4 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON FAX
 SCREEN?
 S5 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON PRINTER
 SCREEN?
 S6 WHETHER OR NOT MESSAGE DATA CAN BE DISPLAYED?
 S7 DISPLAY MESSAGES

FIG. 7

S8 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON COPY
 SCREEN?
 S9 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON FAX
 SCREEN?

S10 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON PRINTER
SCREEN?
S11 MESSAGE DATA NEEDS TO BE DISPLAYED IMMEDIATELY?
S12 SET TIMER
S13 DISPLAY MESSAGES
S14 WHETHER OR NOT DELETION IS INSTRUCTED?
S15 SET TIMER

FIG. 8

COPIER IS AVAILABLE
REDUCTION
SAME SIZE
ENLARGEMENT
ZOOM
SET TO TONER-SAVING MODE FOR DRAFT PRINTING
MESSAGE

FIG. 9

COPIER MAINTENANCE WILL BE PERFORMED ON JULY 7, 1998 FROM 9:00 TO
12:00
PLEASE NOTE THAT COPIER IS NOT AVAILABLE DURING THIS PERIOD

FIG. 10

S21 READ MESSAGE DATA
S22 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON ENTIRE
SCREEN?
S23 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON COPY
SCREEN?
S24 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON FAX
SCREEN?
S25 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON PRINTER
SCREEN?
S26 WHETHER OR NOT DISPLAY KEY HAS BEEN PUSHED?
S27 DISPLAY MESSAGES
S28 WHETHER OR NOT DELETE KEY HAS BEEN PUSHED?
S29 DELETE MESSAGES

FIG. 11

S30 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON COPY
SCREEN?

S31 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON FAX
SCREEN?

S32 WHETHER OR NOT MESSAGE DATA IS TO BE DISPLAYED ON PRINTER
SCREEN?

S33 WHETHER OR NOT DISPLAY KEY HAS BEEN PUSHED?

S34 DISPLAY MESSAGES

S35 WHETHER OR NOT DELETE KEY HAS BEEN PUSHED?

S36 DELETE MESSAGES

FIG. 1

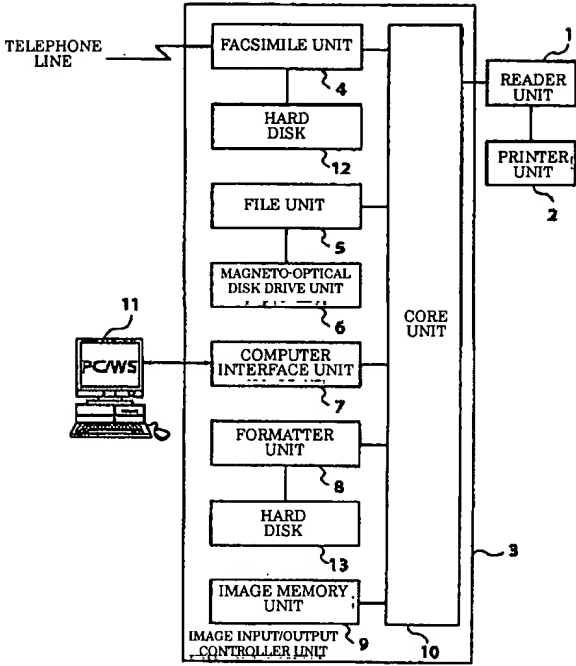


FIG. 2

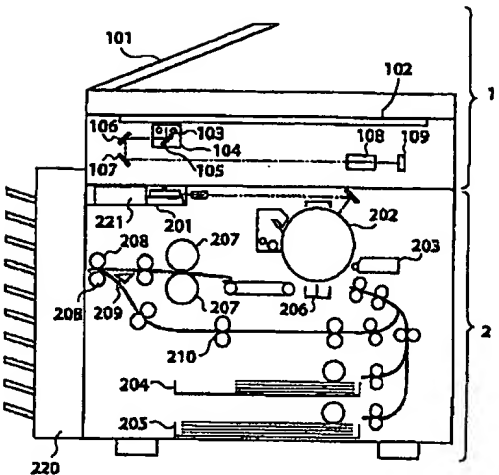


FIG. 3

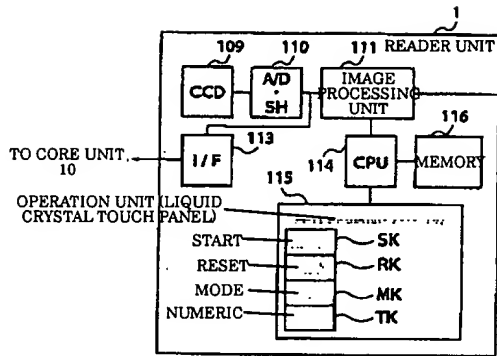


FIG. 4

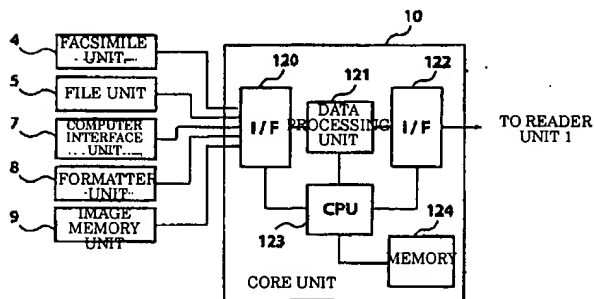


FIG. 5

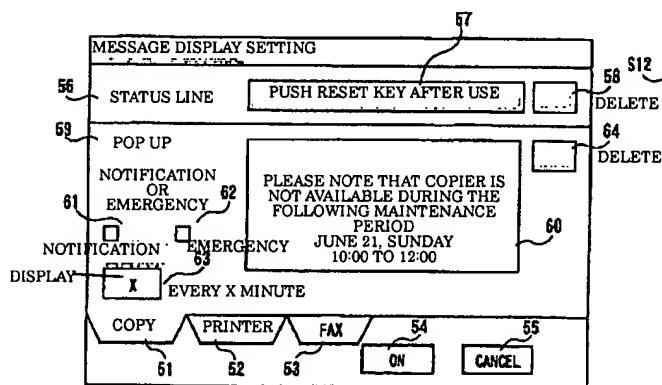


FIG. 6

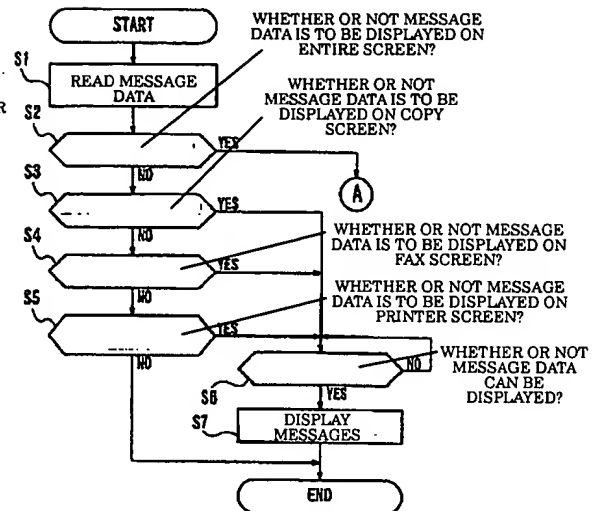


FIG. 7

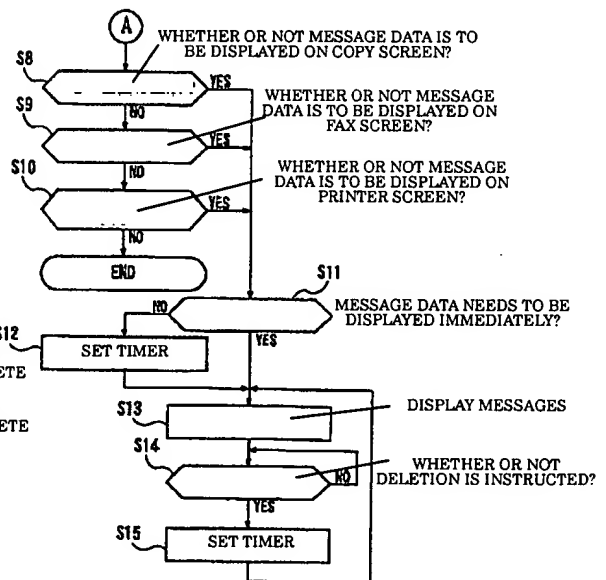


FIG. 8

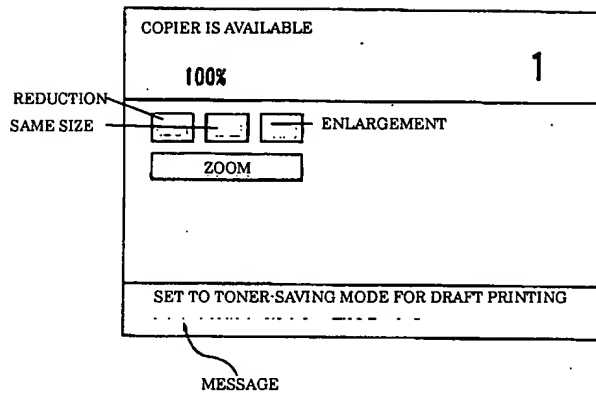


FIG. 9

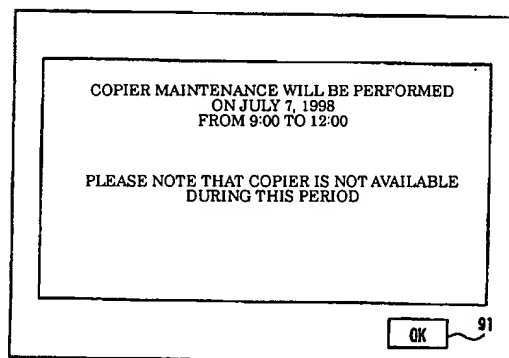


FIG. 10

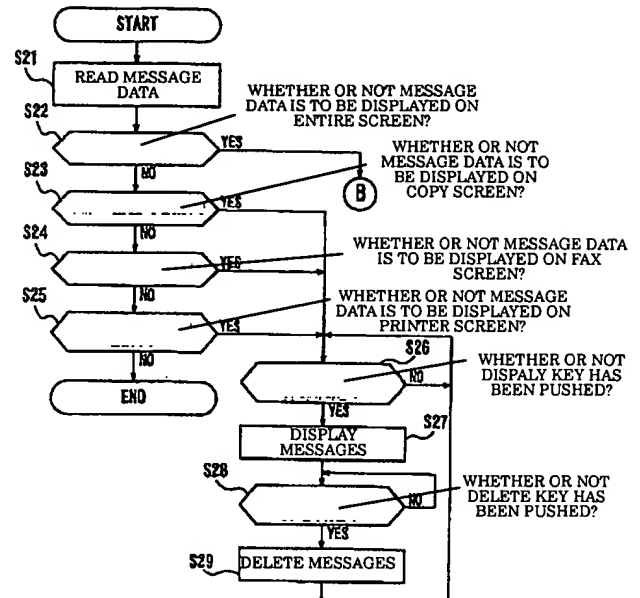


FIG. 11

